

Assessing Academic Performance Disparities: Socioeconomic and Educational Factors among Male Matriculation Students

Muhammad Shahzad^{1*}, Zahira Batool² and Anila Irum³

¹Department of Sociology, University of Gujrat, Punjab, Pakistan; ²Department of Sociology, Government College University Faisalabad, ³Department of Sociology, University of Gujrat, Punjab, Pakistan

*Corresponding author' email: m.shahzad@uog.edu.pk

Education is a crucial area of the Sustainable Development Goals (SDG). Several scholars working on sustainable development have called for research in this significant area. This study responds to these calls. The study aims to assess significant differences in the academic performance of male matriculation students in public schools across various categories of identified socioeconomic and educational factors. The study used systematic and proportionate sampling techniques to select the respondents. Three hundred respondents were selected. To evaluate the study hypotheses, one-way ANOVA and Tukey HSD post hoc tests were utilised. The study found a significant difference in academic performance across various categories of parental education, household income, socioeconomic status, and prior performance. The study did not find any significant differences in the academic performance of students across various categories of family size. The study highlights the significance of socioeconomic and educational factors in determining the academic performance of students. It has specific implications for policymakers and education administrators. It also has broad ramifications for sustainable development goals.

Keywords: Family economic resources, parental education, sustainable development goals, public schools, family size.

INTRODUCTION

The Sustainable Development Goals (SDGs) are greatly advanced by education since they provide inclusive, equitable, high-quality education and encourage opportunities for lifelong learning for all. Education, as a basic human right, enables people to develop the talents, abilities, and knowledge required for sustainable growth on an individual, community, and societal level (Boeve-de Pauw, Gericke, Olsson, & Berglund, 2015). Education increases economic growth, lowers inequality, and promotes social cohesion by fostering literacy, numeracy, critical thinking, and problem-solving abilities. Moreover, one of the important aspects of education that need immediate attention is academic performance. It is important to comprehend the dynamics and variables that affect students' academic performance (Agbedahin, 2019). Student academic performance is an important field of research with broad implications for educational justice, societal advancement, and individual success. Academic performance is a key determinant of educational success and has a significant impact on future possibilities and social mobility for an individual (Aguirre-Dávila, Morales-Castillo, & Moreno-Vásquez, 2023). Academic achievement is

strongly associated with several favourable outcomes, such as greater income levels, better health outcomes, and enhanced civic involvement, in addition to its direct impact on educational trajectories (X. Chen, Huang, & Huang, 2023). Furthermore, finding and solving gaps in learning outcomes depend on an understanding of the factors that influence academic success. Significant achievement gaps based on economic status, race, ethnicity, and other demographic characteristics have been repeatedly shown by research (Cheng, Armatas, & Wang, 2020). To promote educational fairness and make sure that all young people have access to the tools and support they need to succeed academically, it is critical to investigate the reasons behind these discrepancies. While the importance of education in the SDGs is recognized, limited research explores significant differences in academic performance regarding socioeconomic and prior educational disparities among students.

The current study aims to investigate these factors proposes to find significant differences in academic performance across various categories of socioeconomic and educational factors among male matriculation of public schools. In particular, this study aims to investigate how different socioeconomic factors—such as family size, parental education levels,

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household income, and prior educational performance—affect academic achievement. This research attempts to advance knowledge of the intricate relationship between socioeconomic background and academic achievement by examining these variables in the context of matriculation education in public schools.

This study is important because it can help shape focused programmes and policies that try to enhance academic performance and lessen gaps in educational attainment. Policymakers, educators, and other stakeholders can create strategies to address the root causes of educational inequality and advance more equity in education by recognising the major socioeconomic determinants of academic achievement. Furthermore, the results of this study have implications for the planning and execution of successful at-risk student support programmes, which will eventually improve the students' prospects of both academic achievement and socioeconomic progress. Through an analysis of the effects of parental education, household income, prior educational performance, socioeconomic status, and family size, this research seeks to advance our knowledge of the variables influencing educational outcomes and provide guidance for initiatives that support educational equity and excellence. Additionally, research on academic achievement is critical to advancing educational justice, society advancement, and personal well-being. Through an examination of the socioeconomic factors influencing academic achievement among male students matriculating into public schools, this study aims to advance our knowledge of the variables affecting educational outcomes and provide guidance for the development of a more inclusive and equitable educational system.

LITERATURE REVIEW

Academic performance is a complex construct that is shaped by a range of contextual, familial, and individual factors. This section reviews the body of research on the socioeconomic factors that influence academic performance in the context of public school matriculation. Specifically, we look at parental education, household income, prior educational attainment, socioeconomic status (SES), and family size.

One of the most reliable indicators of academic success is parental education (Beckmeyer, Troilo, & Markham, 2020; Berkowitz *et al.*, 2021; Bodovski, Munoz, & Apostolescu, 2022; Boonk, Gijssels, Ritzen, & Brand-Gruwel, 2022). Higher parental education levels are associated with higher academic accomplishment since research continuously shows a positive correlation between parental education levels and children's academic outcomes (Grijalva-Quinonez, Valdés-Cuervo, Parra-Pérez, & Vazquez, 2020; Guo, Guo, He, Liu, & Luo, 2020; Ibrahim, Musthafa, & Marikar, 2021). Numerous reasons, such as higher parental involvement in school, easier access to educational materials, and the passing down of academic expectations and ideals from parents to

children, can be ascribed to this relationship (Panaoura, 2021). A further significant factor influencing academic performance is household income, however, it has varied and intricate consequences. The relationship between household income and academic performance is not always straightforward, but research shows, that more household income is linked to better academic outcomes because of improved access to educational resources and opportunities (Dong, 2022). The association between household income and academic performance can be moderated by variables like income inequality, neighbourhood features, and access to high-quality schools, which can result in differences in educational results (Y. Liu, Q. Jiang and F. Chen, 2020a).

Additionally, future academic success is strongly predicted by prior educational performance, which is frequently assessed by grades or results on standardised tests (Kleemola & Hyytinen, 2019; Kleemola, Hyytinen, & Toom, 2023; Kriegbaum, Jansen, Spinath, & differences, 2015). Higher achievers in earlier grades have a greater chance of maintaining or improving their academic standing over time. Furthermore, students' interest and perseverance in studying might be influenced by their past academic success, which can act as a substitute for academic aptitude and motivation. Likewise, academic performance is significantly impacted by socioeconomic status (Arshad, Ahmed, & Tayyab, 2019; Brinkworth, McIntyre, Juraschek, & Gehlbach, 2018). Socioeconomic status (SES) refers to an individual's or family's social and economic position within society, typically determined by factors such as income, education level, occupation, and access to resources. It encompasses both objective measures (e.g., income level, educational attainment) and subjective perceptions of social standing and financial security. SES is often used as an indicator of an individual's or household's relative advantage or disadvantage within a given social context. Higher SES students typically do better than lower SES counterparts, and SES differences are largely responsible for the achievement disparity in educational outcomes that is shown. Cultural capital, social networks that support academic performance, and access to educational resources are the mechanisms underpinning the SES-achievement relationship (Hu, 2023). Another significant factor associated with academic performance is family size. While it has not been extensively studied concerning academic performance, it is acknowledged as a potential socioeconomic determinant (Usen, 2016). Research indicates that larger family sizes may be associated with less parental resources and attention available for each child, which may harm academic outcomes (Blaabæk, Jæger, & Molitoris, 2020; C. Chen, Terrizzi, Chou, & Lien, 2020). Nevertheless, other factors, such as parental education and socioeconomic status, may mediate the relationship between family size and academic performance (Rodríguez *et al.*, 2019).



Overall, the research indicates that when assessing the academic performance of male matriculation students in public schools, socioeconomic and educational aspects are critical considerations. Therefore, the goal of the study is to look into notable variations in public school matriculation students' academic performance across a range of categories of recognised socioeconomic and educational characteristics. Particularly, this study aims to assess significant differences in academic performance across various categories of parental education, household income, prior educational performance, socioeconomic status, and family size.

MATERIALS AND METHODS

All ninth-grade pupils from public schools in the Faisalabad district made up the study's population. The rationale behind choosing these students was that they had complete prior academic record in the form of result card of eight class. This results card were crucial because the study also proposed to assess the impact of the prior academic performance. The male students in the ninth grade at all public schools in Tehsil City, Faisalabad, were the target population. In this study, multistage sampling was employed. The district of Faisalabad is made up of six tehsils. Simple random sampling was used to choose one sample for the first stage. There were 40 male schools in this tehsil. The Faisalabad office of the District Education Officer (DEO) provided a list of schools. Ten schools were chosen at random from the teacher selection pool for the second stage. Finally, a basic random sampling of each class's students was used to choose the participants. Students were chosen using a proportionate sampling technique. Students were selected from each class. Four hundred and fifty of the students were given questionnaires. A total of 330 surveys were finished. Thirty questions were incomplete and contained several missing values. Consequently, these surveys were not given any thought. Ultimately, 300 surveys were found to be precise and thorough.

The study variables were measured using a structured questionnaire administered to the participants. For mother and father education, respondents were asked to indicate the highest level of education completed by their parents, with options ranging from "Illiterate (No Schooling)" to "Higher Level (College, University)." Household income was assessed by asking participants to estimate their family's annual income within specified income brackets. Prior performance was self-reported by participants, who rated their academic performance in the previous academic year as "Low performance," "Average performance," or "High performance." Socioeconomic status (SES) was determined based on participants' subjective perceptions of their family's socioeconomic status, categorized as "Low," "Medium," or "High." Family size was determined by asking participants to indicate the number of members in their immediate family,

with options for "Small" (1-3 members), "Medium" (4-6 members), or "Large" (7 or more members). These items were carefully chosen to capture key sociodemographic factors that could potentially influence academic performance among the study participants.

Since board exam scores are the most widely used indicator of a student's academic performance and are most likely to be influenced by the dynamics of the student's immediate academic contexts, it is important to note that for this study, student academic performance was defined as board exam scores. The standardized composite score of a student's academic achievement on a ninth-grade exam serves as the dependent variable. Every year, the Board of Intermediate and Secondary Education (BISE) in Faisalabad organizes it. This variable is at the interval level. This exam has a score range of 0 to 550. In the current study, terms such as academic achievement, educational results, academic attainment, academic score, and academic marks were used interchangeably.

Using a cross-sectional and quantitative research approach, the study's hypotheses were evaluated. IBM SPSS for Windows (27 version) was used in the study to administer the One- way ANOVA and post hoc tests. To find out if there are statistically significant differences in a dependent variable across three or more independent groups, a one-way ANOVA test is employed. It evaluates whether score distributions differ amongst groups, providing valuable information regarding potential group distinctions. Tukey HSD tests were used to assess significant differences between the different categories of independent variables after this test.

RESULTS AND DISCUSSIONS

Table 1 presents the sociodemographic characteristics of the study participants. Among the mothers, the highest percentage (36.7%, $n = 110$) had completed education up to the secondary level (VI-X). This was followed by 24.3% ($n = 73$) of mothers who had education at a higher level (college or university). A significant portion (21.3%, $n = 64$) of mothers had no formal schooling, while 17.7% ($n = 53$) had completed education up to the primary level (I-V). Regarding fathers' education, the largest proportion (34.3%, $n = 103$) had education up to the secondary level (VI-X). An equal percentage (34%, $n = 102$) had an education at the higher level (college or university). A smaller percentage (18%, $n = 54$) of fathers had no formal schooling, while 13.7% ($n = 41$) had completed education up to the primary level (I-V). In terms of household income, the majority of households fell within the income range of 10,000 to 29,999, comprising 26.7% ($n = 80$) of the total participants. About 21.3% ($n = 64$) of households had an income of less than 10,000, while 20.3% ($n = 61$) had an income between 50,000 to 69,999. Relatively fewer households reported higher incomes, with 8.0% ($n = 24$) earning between 70,000 to 89,999, and 4.0% ($n = 12$) earning



more than 90,000. Regarding prior academic performance, the largest proportion (45.0%, $n = 135$) of participants reported average performance, while 34.0% ($n = 102$) reported low performance and 21.0% ($n = 63$) reported high performance. In terms of socioeconomic status (SES), half of the participants (50.0%, $n = 150$) fell into the medium SES category, while 25.3% ($n = 76$) were classified as low SES and 24.7% ($n = 74$) as high SES. Lastly, regarding family size, the majority (59.0%, $n = 177$) reported a medium-sized family, followed by 29.3% ($n = 88$) reporting a small family size, and 11.7% ($n = 35$) reporting a large family size.

Table 1. Sociodemographic characteristics.

Mother education	Frequency	Percentage
Illiterate (No Schooling)	64	21.3
Primary Level (I-V)	53	17.7
Secondary Level (VI-X)	110	36.7
Higher Level (College, University)	73	24.3
Father education		
Illiterate (No Schooling)	54	18.0
Primary Level (I-V)	41	137.0
Secondary Level (VI-X)	103	34.3
Higher Level (College, University)	102	34.0
Household income		
less than 10000	64	21.3
10000--29999	80	26.7
30000-49999	59	19.7
50000-69999	61	20.3
70000-89999	24	8.0
More than 90000	12	4.0
Prior performance		
Low performance	102	34.0
Average performance	135	45.0
High performance	63	21.0
SES		
Low	76	25.3
Medium	150	50.0
High	74	24.7
Family size		
Small	88	29.3
Medium	177	59.0
large	35	11.7

Table 2 presents the results of one-way ANOVA and Table 3 shows results of Post hoc test of Tukey HSD.

H1: There are significant differences in academic performance across different education levels of mothers.

Hypothesis H1 evaluates if there are significant differences in academic performance across different education levels of mothers. The results of A one-way ANOVA revealed a statistically significant difference in academic performance across different education levels of mothers ($F(3, 296) =$

$15.00, p < .001, \eta^2 = .13$), indicating a moderate effect size. Moreover, η^2 , also known as eta-squared, is a measure of effect size commonly used in analysis of variance (ANOVA) to quantify the proportion of variance in the dependent variable that is explained by the independent variable(s). In qualitative terms, η^2 indicates the strength or magnitude of the relationship between the independent and dependent variables. Tukey's HSD test for multiple comparisons found significant differences in mean academic performance between illiterate mothers and those with secondary level education ($p = .001, 95\% \text{ CI} = [-70.35, -13.97]$), illiterate mothers and those with higher education ($p < .001, 95\% \text{ CI} = [-100.49, -39.07]$), primary level educated mothers and those with secondary level education ($p = .010, 95\% \text{ CI} = [-66.34, -6.36]$), primary level educated mothers and those with higher education ($p < .001, 95\% \text{ CI} = [-96.34, -31.61]$), and secondary level educated mothers and those with higher education ($p = .044, 95\% \text{ CI} = [-54.70, -0.55]$). This finding is consistent with that of Chung, Phillips, Jensen, and Lanier (2020) who found that a mother's education level makes significant differences in the academic performance of students.

H2: There are significant differences in academic performance across different levels of Father Education.

Hypothesis H2 evaluates if there are significant differences in academic performance across different levels of Father Education. A one-way ANOVA revealed a statistically significant difference in academic performance across different levels of father education ($F(3, 296) = 12.28, p < .001, \eta^2 = .11$), indicating a moderate effect size. Tukey's HSD test found significant differences in mean academic performance between illiterate fathers and those with primary level education ($p = .025, 95\% \text{ CI} = [-78.92, -3.72]$), illiterate fathers and those with secondary level education ($p = .001, 95\% \text{ CI} = [-76.88, -15.89]$), illiterate fathers and those with higher education ($p < .001, 95\% \text{ CI} = [-102.11, -41.02]$), and between fathers with primary level education and those with no formal schooling ($p = .001, 95\% \text{ CI} = [15.89, 76.88]$). Comparison of this finding with those of other studies confirms that father education is an important factor that affects the academic performance of students (Ibrahim et al., 2021; Kemple Reeves, Domenech Rodríguez, & Vázquez, 2023; Kim & Society, 2020).

H3: There are significant differences in academic performance across different levels of household income

Hypothesis H3 evaluates if there are significant differences in academic performance across different levels of household income. A one-way ANOVA revealed a statistically significant difference in academic performance across different levels of household income ($F(5, 294) = 11.16, p < .001, \eta^2 = .16$), indicating a moderate effect size. Tukey's HSD test found significant differences in mean academic performance between households with incomes less than 10,000 and all other income groups ($p < .007, 95\% \text{ CI} = [-$



Table 2. One way ANOVA

Variables	mean	sd	df	F	p	η^2
Mother education			3	15	.000	.13
Illiterate (No Schooling)	297.53	66.577				
Primary Level (I-V)	303.34	66.659				
Secondary Level (VI-X)	339.69	70.067				
Higher Level (College, University)	367.32	72.711				
Father education			3	12.28	.000	.11
Illiterate (No Schooling)	285.09	62.553				
Primary Level (I-V)	326.41	74.429				
Secondary Level (VI-X)	331.48	63.424				
Higher Level (College, University)	356.66	78.462				
Household income			5	11.16	.000	.16
less than 10000	292.64	63.699				
10000--29999	320.36	77.889				
30000-49999	335.92	67.127				
50000-69999	344.89	61.042				
70000-89999	376.75	75.334				
More than 90000	420.17	52.662				
Prior performance			2	74.19	.000	.33
Low performance	285.61	54.852				
Average performance	331.15	60.157				
High performance	404.16	70.336				
SES			2	32.53	.000	.18
Low	296.89	67.298				
Medium	322.83	66.894				
High	382.57	68.375				
Family size			2	1.81	1.5	.01
Small	340.56	70.951				
Medium	329.90	73.930				
large	312.49	80.940				

127.526, -65.68]), and between households with incomes between 10,000-29,999 and those with incomes more than 90,000 ($p < .002$, 95% CI = [-99.804, -38.94]). This suggests that students from lower-income households tend to have lower academic performance compared to their counterparts from higher-income households. Additionally, the effect size indicates that household income explains a moderate proportion of the variance in academic performance among matriculation male students in public schools (Y. Liu, Q. Jiang and F. J. C. S. R. Chen, 2020b; Tanskanen, Erola, & Kallio, 2016).

H4: There are significant differences in academic performance across different levels of Prior educational performance.

Hypothesis H4 evaluates if there are significant differences in academic performance across different levels of Prior educational performance. A one-way ANOVA revealed a statistically significant difference in academic performance across different levels of prior educational performance ($F(2, 297) = 74.19$, $p < .001$, $\eta^2 = .33$), indicating a large effect size. Tukey's HSD test found significant differences in mean

academic performance between low and average-performance groups ($p < .001$, 95% CI = [-64.31, -26.77]), low and high-performance groups ($p < .001$, 95% CI = [-141.48, -95.63]), and average and high-performance groups ($p < .001$, 95% CI = [-94.84, -51.18]). This finding also accords with our earlier observations, which showed that prior educational levels make a difference in the academic performance of students. Prior academic background is capital on which students can leverage in coming classes (Alla, 2019; Anane, 2020; Kleemola & Hyytinen, 2019; Kleemola et al., 2023).

H5: There are significant differences in academic performance across different levels of socioeconomic status.

The hypothesis evaluates if there are significant differences in academic performance across different levels of socioeconomic status. A one-way ANOVA revealed a statistically significant difference in academic performance across different levels of socioeconomic status ($F(2, 297) = 32.53$, $p < .001$, $\eta^2 = .18$), indicating a large effect size. Tukey's HSD test found significant differences in mean academic performance between low and medium SES groups



Table 3. Multiple comparisons

Groups	Mean difference	95% CI		P
		Upper	Lower	
Mother education				
Illiterate-Secondary Level (VI-X)	-42.160*	-70.35	-13.97	.001
Illiterate-Higher Level (College, University)	-69.784*	-100.49	-39.07	.000
Primary-Secondary Level (VI-X)	-36.351*	-66.34	-6.36	.010
Primary-Higher Level (College, University)	-63.975*	-96.34	-31.61	.000
Secondary-Higher Level (College, University)	-27.624*	-54.70	-.55	.044
Father education				
Illiterate (No Schooling)-Primary Level (I-V)	-41.322*	-78.92	-3.72	.025
Illiterate (No Schooling)-Secondary Level (VI-X)	-46.383*	-76.88	-15.89	.001
Illiterate (No Schooling)-Higher Level (College, University)	-71.564*	-102.11	-41.02	.000
Primary Level (I-V)- Illiterate (No Schooling)	46.383*	15.89	76.88	.001
Household income				
less than 10000-30000-49999	-43.275*	-78.76	-7.79	.007
less than 10000-50000-69999	-52.245*	-87.42	-17.07	.000
less than 10000-70000-89999	-84.109*	-131.17	-37.05	.000
less than 10000-More than 90000	-127.526*	-189.37	-65.68	.000
10000-29999-70000-89999	-56.388*	-102.14	-10.63	.006
10000-29999-More than 90000	-99.804*	-160.66	-38.94	.000
30000-49999-More than 90000	-84.251*	-146.51	-22.00	.002
Prior performance				
Low-Average performance	-45.540*	-64.31	-26.77	.000
Low-High performance	-118.551*	-141.48	-95.63	.000
Average-High performance	-73.011*	-94.84	51.18	.000
SES				
Low-Medium	-25.939*	-48.28	-3.60	.018
Low-High	-85.673*	-111.59	-59.76	.000
Medium-High	-59.734*	-82.28	-37.19	.000
Family size				
Small-Medium	10.653	12.06	33.36	.03
Small-High	28.071	6.72	62.86	.02
Medium-High	17.418	14.79	49.63	.04

Note: Statistical Test. Tukey HSD

*. The mean difference is significant at the 0.05 level

($p = .018$, 95% CI = [-48.28, -3.60]), low and high SES groups ($p < .001$, 95% CI = [-111.59, -59.76]), and medium and high SES groups ($p < .001$, 95% CI = [-82.28, -37.19]). To this result, previous studies have demonstrated that SES significant factor that differentiates between academically high performers and low performers (C. Chen *et al.*, 2020; Shen, 2023; Yi, Na, & Lee, 2023).

H6: There are significant differences in academic performance across different levels of Family size.

Hypothesis H6 evaluates if there are significant differences in academic performance across different levels of Family size. A one-way ANOVA did not reveal a statistically significant difference in academic performance across different levels of family size ($F(2, 297) = 1.81$, $p = .5$), indicating a negligible effect size. In contrast to earlier findings, however, no

evidence of family size making a difference in the academic performance of students was found (Blaabæk *et al.*, 2020; Liu *et al.*, 2020b). Plausible reasons for this unexpected finding are changes in societal norms, educational policies, or family structures over time. This may influence the relationship between family size and academic performance. Consequently, leading to varying results across studies conducted at different time points.

Conclusion: In conclusion, this study underscores the critical role of socioeconomic and educational factors in shaping the academic performance of male matriculation students in public schools. The findings reveal significant disparities in academic achievement across categories of parental education, household income, socioeconomic status, and prior



performance. These results emphasize the importance of addressing educational inequalities and implementing targeted interventions to support students from disadvantaged backgrounds. Furthermore, the study's implications extend beyond the educational sphere, highlighting the broader ramifications for achieving Sustainable Development Goals (SDGs). By recognizing the interconnectedness between education and sustainable development, policymakers and education administrators can devise strategies to promote equitable access to quality education and foster inclusive learning environments. Ultimately, addressing socioeconomic disparities in education is essential for advancing societal progress and realizing the vision of sustainable development. Thus, the study significantly contributes to filling the existing research gap by providing comprehensive insights into the academic performance among ninth-grade male students in public schools. This contribution addresses the research problem identified in the introduction.

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